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SCIENCE REVIEW OF THE YEAR

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SCIENCE NEWS LETTER

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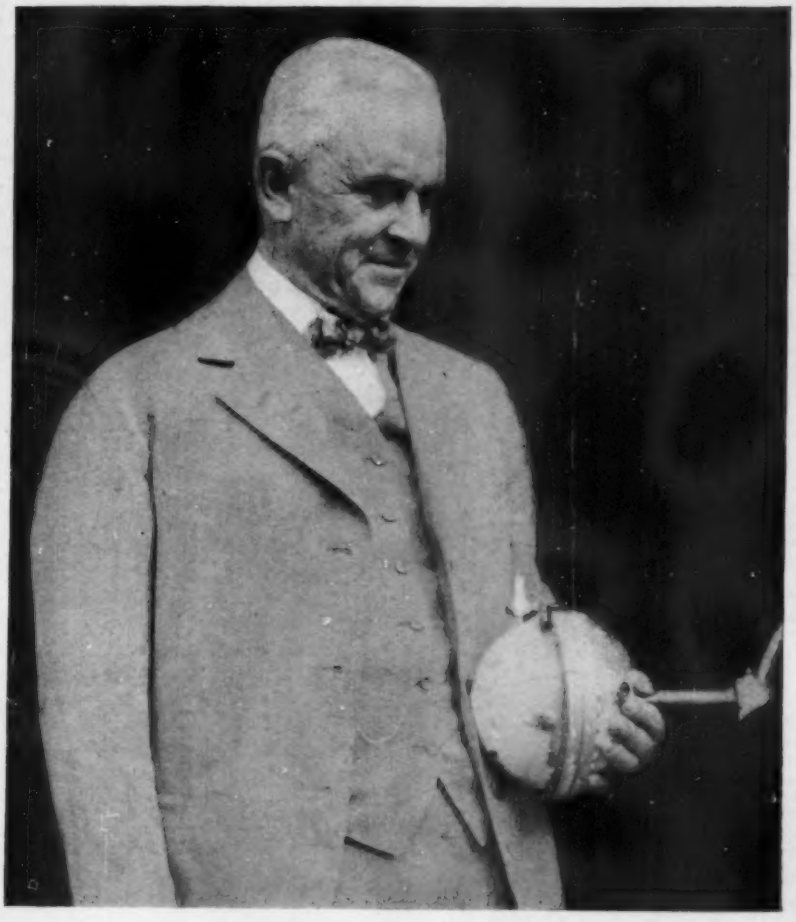
THE WEEKLY SUMMARY OF CURRENT SCIENCE•



DECEMBER 27, 1930

Scientist and Leader of Scientists

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The Weekly Summary of Current Science

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DO YOU KNOW THAT

The oldest Egyptian mummies are almost 5,000 years old.

The drought of the past summer caused heavy casualties among fish in at least 19 states.

Bodies of Egyptains who were buried in the dry sands before 3500 B. C. are sometimes better preserved by nature than the later burials in costly stone tombs.

The big rivers of the United States are not likely to flood during the present winter, for streams are lower and drier than they have been in several decades.

Excavations for apartment house basements in New York City have brought to light the teeth of extinct elephants.

Among the serious automobile accidents in Massachusetts every month, stolen cars figure in about 20 of the crashes and injuries.

New surveys of the island of Martinique show that the island contains almost 30,000 more acres than had been supposed.

Fireproof paper money that will not tear or wear out has recently been produced.

The first pneumatic tires, made in 1845, were manufactured out of canvas and leather and were for use on cart wheels.

Patients are entering mental hospitals of the United States at the rate of one admission every four minutes of the day.

The first railroad line built in America is to be abandoned, 101 years after it was laid.

Latest estimates place the number of Jews in the United States at 4,228,000, and of these 1,765,000 live in New York City.

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Science Service presents over the radio, an address,

HARNESSING THE ELECTRON

By O. H. Caldwell, formerly Federal Radio Commissioner and now editor of *Electronics*, the first and only magazine to be devoted to the numerous devices that make use of the electron.

Friday, January 2, 1931, at 3.45 P. M., Eastern Standard Time.

Over Stations of

The Columbia Broadcasting System

ENDOCRINOLOGY

Hormone Rescues Hopeless Victims of Addison's Disease

Ninety Patients Saved From Death by Substance Thought To Have Effect Similar to That of Insulin on Diabetes

DR. LEONARD G. ROWNTREE has reported before a staff meeting of the Mayo Clinic at Rochester, Minn., his experience in the treatment of Addison's disease with a substance which Drs. W. W. Swingle and J. J. Pfiffner, of Princeton University, have isolated from the suprarenal gland. The substance is not yet on the market. It is being produced in small quantities, in a scientific way, by Drs. Swingle and Pfiffner and Drs. Rowntree and C. H. Greene are investigating its value in treatment.

Years will elapse before its final value will be known, but its immediate effects in the crises of Addison's disease have been dramatic.

To get the significance of this work, a little of the background is necessary. In 1849, Thomas Addison, an English physician, pointed out the relation between disease of the suprarenal glands and a group of symptoms that marked a comparatively rare condition. This condition came to be known as Addison's disease.

The organs which are attacked, the suprarenal glands, are glands of internal secretion; that is, they have no duct leading from them, but give their products directly to the blood stream. They lie above the kidneys, are roughly triangular in shape, and are small but very important. From them comes the well known substance adrenalin and other substances.

Many Have Tried

It is one of these other substances, a material which is essential to life and which is missing in Addison's disease, that a number of scientists have been trying to isolate, and which, apparently, Drs. Swingle and Pfiffner have obtained. Without this substance not a great deal of progress has been made in the treatment of Addison's disease since the days of Addison.

The present period of progress began in March of this year. At that time Drs. Swingle and Pfiffner in a note in *Science* offered experimental evidence that they had isolated the long sought "cortical hormone" of the suprarenal gland. They followed this up by further evidence.

Shortly thereafter, Dr. Rowntree was called to see a patient who was in a state of collapse from Addison's disease, the condition which physicians speak of as a crisis of the disease. Hitherto, treatment of patients in this condition has been practically hopeless. A telegram sent to Dr. Swingle brought a supply of the hormone by air mail.

One of the characteristics of the disease is vomiting that cannot be stopped. The patient just referred to could not retain food. Within two days after the hormone had been given, however, he asked for wieners and sauerkraut but accepted a double order of beefsteak instead. Three days after the last dose of the hormone had been given to this patient he said that he felt in a perfect state of health.

Another patient, who was tired, exhausted, and whose condition was getting worse was given the hormone. By the fifth day she was able to run along the corridor of the hospital without difficulty. The effect has been similar to those just related in three other cases, five in all.

These results are startlingly good. Dr. Rowntree, whose experience with Addison's disease includes some ninety patients, a large number for this rare disease, has not seen their equal. Yet, the question remains how to evaluate the treatment.

On the basis of what has been accomplished, Drs. Swingle, Pfiffner, Rowntree and Greene make no claim that the cure of Addison's disease has been found. Neither would any other scientist. Insulin is not a cure for diabetes, but it is a substitute for a missing necessary substance, and, after nearly ten years, it seems that it will maintain life and a state as effective as health.

Whether or not the suprarenal cortical hormone will prove as efficient as insulin is as yet unknown. In many cases of Addison's disease the underlying condition which causes destruction of the suprarenal glands is tuberculosis. There is no reason to believe that the cortical hormone will cure tuberculosis. It is not even known yet whether, if the tuberculosis is checked, the hormone will prolong life year after year, as it is becoming evident that insulin seems able to do in diabetes.

Dr. W. W. SWINGLE

Who with Dr. J. J. Pfiffner, both of Princeton University, isolated what is thought to be the long sought "cortical hormone" of the suprarenal gland, and which has been successful in combating Addison's disease.

It apparently is established, however, that the cortical hormone has saved life in the crises of Addison's disease. In the words of Dr. Rowntree, before the Post Graduate Medical Assembly, at its recent meeting:

"The effects in the crises of Addison's disease are as striking, and I believe as sure, as the effects of insulin in the coma of diabetes. Time only will reveal to what extent the cortical hormone could constitute a cure."

Science News Letter, December 27, 1930

METEOROLOGY—SEISMOLOGY

Storm May Have Caused Earth to Quiver

SEVERE earth vibrations, known to scientists as "microseisms," which occurred for several days beginning Sunday, Dec. 14, seem to be associated with the area of low atmospheric pressure that was travelling up the Atlantic coast at the time. Rev. F. W. Sohon, S. J., in charge of the Georgetown University Seismograph Station in Washington, said that the vibrations were very marked, and would have prevented a satisfactory record of a real earthquake

if one had occurred then. He stated, however, that while severe, they were not extraordinarily so, but that they had often been observed in the past, of even greater intensity.

He cited the opinion of his predecessor, the late Rev. F. A. Tondorf, S. J., that the low pressure area produces a shaking of the entire coast, which is recorded on the sensitive seismograph. Microseisms differ from earthquakes in that they are continuous, while the actual earthquake record is separated into well-defined phases. The microseism vibrations have a period of four or five seconds, while the earthquake waves are much longer.

Science News Letter, December 27, 1930

ORNITHOLOGY

Talking Bird From India Found Wild in California

Fearing Spread of Another Pest Like Sparrow and Starling, Authorities Destroy Mynah Colony and Look for More

A TALKING bird from India, that can mimic human speech better than a parrot, has been found wild in Los Angeles, nesting in a tile air vent of a Spanish house. But instead of being welcomed, this bird, the common or house mynah, was immediately set upon as an undesirable alien and the little colony, seven individuals all told, exterminated by the authorities. They are now hunting for other possible mynah colonists, determined to keep this foreign species from gaining a foothold in America.

The objection to the mynah is essentially the same as the objection to the English sparrow and the European starling, which have become widespread pests in this country. Interesting enough individually, and even well liked as pets, mynahs in the wild state form huge, noisy flocks that haunt the homes of men, nesting under the eaves and in all other crannies they can find about buildings. They multiply with surprising rapidity and become a menace to native birds, not only because they compete with them for food but also because of their overbearing truculence against other species. Their huge flocks are also troublesome feeders in fruit-raising regions.

Though the common mynah has gained a foothold in many localities outside its native land, it has never before been reported from North America in a wild state. A close relative, the crested mynah or Chinese starling, however, has established itself in British Columbia, and its spread into the United States is to be feared.

The common mynah can be identified by its large size (slightly greater than that of a robin), its dark plumage, with white wing and tail feathers showing prominently in flight, its conspicuous yellow bill, yellow legs, and bare patch of yellow behind the eye.

The discovery of the Los Angeles mynah colony was made by Dr. Calla E. Starbuck. She reported her find to the Los Angeles Museum and to the University of California at Los Angeles. George Willett, ornithologist of the museum, and Dr. Loye Miller, chairman of the biology department of the university, confirmed the identification. Deputies of the Los Angeles County Agricultural Commission destroyed the colony.

Science News Letter, December 27, 1930

INDUSTRIAL SAFETY

Young Girls Oftenest Hurt in Industry

OF THE women injured in industrial accidents, the greatest numbers are in the younger age groups, the U. S. Women's Bureau has found from a study of cases receiving employee's compensation in eight states.

In Maryland, over 40 per cent. of the compensation claims allowed during one year were for accidents to young girls under 21 years of age. This number is way out of proportion to the number of that age employed in industry, for census figures show less than 21 per cent. of employed women in Maryland to be under 20. In other states the proportion of injured under 21 years run from 25.5 per cent. in Massachusetts to 37 per cent. in Georgia.

Although fewer girls than boys were hurt, the proportion of young people was higher for the women. Young people were most often hurt by machinery; older ones by falls. The most serious injuries occured in the laundry industry.

Science News Letter, December 27, 1930

UNDESIRED IMMIGRANT

Agreeable as a pet, but a nuisance as a neighbor: the common mynah of southeastern Asia, whose appearance in Los Angeles was hailed with anything but joy by the authorities.

CHEMISTRY

Missouri Chemists Refine Radium From Watch Paint

CHEMISTS at the University of Missouri, Columbia, Mo., under supervision of Dr. Herman Schlundt, have started in operation the only known factory in the United States for refining radium from the paint off luminous dials of old watches and clocks. Already several thousands of dollars' worth of the precious element has been recovered in this manner.

Out of several hundred pounds of paint about one-hundredth part of an ounce is radium. At the present market price this element is nearly $70 a milligram, or almost $2,000,000 an ounce.

A refining plant for mesothorium, another commonly used radioactive element, was also established by Dr. Schlundt at the University of Missouri and has been in operation several years. Last year between $25,000 and $50,000 worth of mesothorium was refined.

By way of comparison it has been pointed out that mesothorium is worth about $40 a milligram while radium is worth nearly twice that amount. Radium endures thousands of years but its substitute loses one-half its strength in seven.

Science News Letter, December 27, 1930

GENERAL SCIENCE

Cleveland A. A. A. S. Meetings To Summarize Science Progress

More Than 1,000 Papers Will Present Recent Advances in All Science Fields Before American Association

MORE than five thousand scientists from all sections of the United States and Canada will attend meetings of over fifty scientific organizations to be held in Cleveland, Ohio, New Year's week. More than a thousand papers will be read in this year's largest meeting and millions of words will be uttered by the scientists in announcing their new researches.

The American Association for the Advancement of Science is the nucleus for the annual meetings. Joining with this organization are specialized societies covering all fields of science, from anthropology to zoology.

Dr. Robert A. Millikan, Nobel prizeman in physics, will deliver the retiring presidential address of the American Association on "Atomic Disintegration and Atomic Synthesis."

A prize of $1,000 for a notable contribution to science will be awarded to one out of the many papers presented at the meeting.

The future of man will be predicted by biologists and anthropologists. Mathematicians will give thought to economic cycles and crises as well as their theoretical studies. The latest battles in man's war upon the insects will be retold and new campaigns planned. How better plants and animals can be secured will be discussed by biologists. Engineers will describe telephones, metals, telescopes and water problems.

Economic and sociological societies will hold annual meetings coincidently with the biological and physical science groups. The American Statistical Association, the American Political Science Association, the American Sociological Society, and the American Economic Association will bring many sociologists to Cleveland.

Western Reserve University and the Case School of Applied Science will be hosts to the visiting scientists.

In addition to the meetings at Cleveland, a number of other scientific groups will assemble at this season.

The scientists, who study the earth layers and fossils which tell the history of this globe's past, will hold meetings at the University of Toronto, December 29 to 31.

Psychologists, archaeologists and philologists will concentrate at the State University of Iowa, Iowa City, beginning December 29, attracted by national meetings of their societies.

Current battles against germs and recent enslavements of bacteria to do useful work will be revealed at the meeting of the Society of American Bacteriologists in Cambridge, Mass., December 29 to 31.

Astronomers will gather at Yale University, New Haven, Conn., on New Year's Day for a three-day session of the American Astronomical Society.

The future of the forests of the country will be discussed when the Society of American Foresters meets in Washington for three days beginning December 29.

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ARCHAEOLOGY-ARCHITECTURE

Architectural Link Found in Egypt

OLD, old stone buildings, found recently at Sakkara, in Egypt, represent an important missing link in the world's architectural history, is the view of the French architect, J. P. Lauer, reported to the *Gazette des Beaux Arts*.

The buildings are pronounced some of the very first important experiments in dressed stone architecture. They were funerary temples built close by the first of the great stone pyramids ever to be erected for an Egyptian pharaoh.

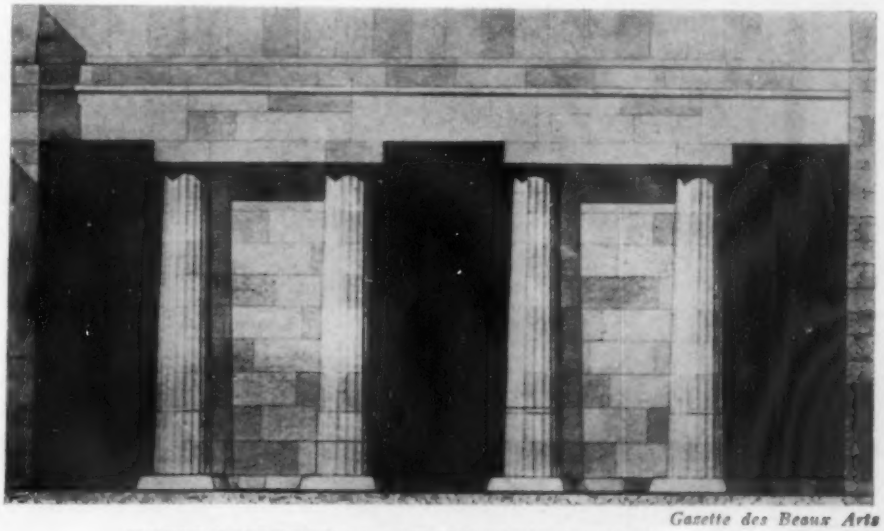
These temples have been buried in the sand until the first trace of them was discovered six years ago. They have now been unearthed in the course of several years' excavations by C. M. Firth, British archaeologist, in the Department of Antiquities of Egypt.

The buildings are recognized as an entirely new architecture from Egypt. Fluted columns strikingly like the Doric columns of Greece are one feature of this oldest stone architecture. These Egyptian columns were designed more than two thousand years before the Greeks used such columns in their temples.

From his studies of the architecture, M. Lauer declares that it is so delicate and graceful that it would have only imperfectly fitted the requirements of stone construction. That explains why this ancient style has been lost and forgotten. It appears that the first Egyptian architect who turned to the use of stone tried out the new building material in the style that was successful when wood and brick and reeds were used. These plans were soon modified into the more massive style that we know today as characteristic Egyptian stone architecture.

The temples are attributed to the world's oldest architect whose name is known today: that is, the Egyptian Imhotep.

Science News Letter, December 27, 1930



Gazette des Beaux Arts

DORIC COLUMNS 2000 YEARS OLDER THAN GREECE

PHYSICS

The Charge of the Electron

"A Classic of Science"

One of the classic researches of Dr. Robert A. Millikan, now Chairman of the Executive Council of the California Institute of Technology, was the determination of the charge on the electron, an achievement which was recognized by the Nobel prize award to him in 1923. As retiring president of the American Association for the Advancement of Science next week in Cleveland, Dr. Millikan will explain phases of his continued probing into the constitution of matter. For several years he has studied the powerful cosmic radiation which he first measured. The cover of this week's SCIENCE NEWS LETTER shows Dr. Millikan holding the latest type of cosmic ray electroscope which measures the intensity of the radiation.

A NEW MODIFICATION OF THE CLOUD METHOD OF DETERMINING THE ELEMENTARY ELECTRICAL CHARGE AND THE MOST PROBABLE VALUE OF THAT CHARGE. By Prof. R. A. Millikan. In the London, Edinburgh and Dublin Philosophical Magazine and Journal of Science. Vol. XIX, February, 1910.

AMONG all physical constants there are two which will be universally admitted to be of predominant importance; the one is the velocity of light, which now appears in many of the fundamental equations of theoretical physics, and the other is the ultimate, or elementary, electrical charge, a knowledge of which makes possible a determination of the absolute values of all atomic and molecular weights, the absolute number of molecules in a given weight of any substance, the kinetic energy of agitation of any molecule at a given temperature, and a considerable number of other important physical quantities.

While the velocity of light is now known with a precision of one part in twenty thousand, the value of the elementary electrical charge has until very recently been exceedingly uncertain. The results herewith presented seem to show that the method here used for its determination—a modification of the Thompson-Wilson cloud method—furnishes the value of e with a directness, certainty, and precision, easily comparable with that obtained by any of the methods which have thus far been used, the error in the final mean value being not more than 2 per cent. Furthermore, with the use of a chronograph in place of a stop watch for taking time intervals, the method is perhaps capable of a slightly greater accuracy than has yet been given to it.

As is well-known, H. A. Wilson's modification of Thomson's cloud method of determining e consists in observing first, the rate of fall under gravity of a cloud produced in an ionized fog-chamber by a sudden expansion, and second, the rate of fall of a like cloud when a vertical electrical field is superposed upon gravity. . .

The outstanding causes of uncertainty in Wilson's method, as used by ourselves, were as follows:

1. There is an experimental difficulty involved in obtaining clouds which fall without any distortion of the upper surface because of air currents.

2. The upper surface of a cloud falling in an electrical field is exceedingly difficult to follow on account of the scattering of the cloud which is usually produced by throwing on the field.

3. The method necessitates the assumption that it is possible to obtain in successive expansions exactly identical drops, so that v_2 and v_1 can be used as though they applied to the same drop.

4. The assumption is made that the cloud falls uniformly, and that there is no appreciable evaporation during the time of observation.

5. The assumption is made that the temperature of the air through which the cloud falls is the equilibrium temperature after condensation—a quantity obtained from theoretical considerations relating to the adiabatic expansion of saturated vapours and the experimental curve expressing the relation between the temperature and density of a saturated vapour.

The results obtained by the method herewith presented are freed from all of these sources of uncertainty. . .

Balancing Individual Charged Drops By An Electrostatic Field

My original plan for eliminating the evaporation error was to obtain, if possible, an electric field strong enough to exactly balance the force of gravity upon the cloud and by means of a sliding contact to vary the strength of this field so as to hold the cloud balanced throughout its entire life. In this way it was thought that the whole evaporation-history of the cloud might be recorded, and suitable allowances then made in the observations on the rate of fall to eliminate entirely the error due to evaporation. It was not found possible to balance the cloud as had been originally planned, but it was found possible to do something very much better; namely, to hold individual charged drops suspended by the field for periods varying from 30 to 60 seconds. I have never actually timed drops which lasted more than 45 seconds, although I have several times observed drops which in my judgment lasted considerably longer than this. The drops which it was found possible to balance by an electrical field always carried multiple charges, and the difficulty experienced in balancing such drops was less than had been anticipated.

The procedure is simply to form a cloud and throw on the field immediately thereafter. The drops which have charges of the same sign as that of the upper plate or too weak charges of the opposite sign, rapidly fall, while those which are charged with too many multiples of sign opposite to that of the upper plate are jerked up against gravity to this plate. The result is that after a lapse of 7 or 8 seconds the field of view has become quite clear save for a relatively small number of drops which have just the right ratio of charge to mass to be held suspended by the electric field. These appear as perfectly distinct bright points. I have on several occasions obtained but one single such "star" in the whole field and held it there for nearly a minute. For the most part, however, the observations recorded below were made with a considerable number of such points in view. Thin, flocculent clouds, the production of which seemed to be facilitated by keeping the water-jackets J_1 and J_2 a degree or two above the temperature of the

room, were found to be particularly favorable to observations of this kind.

Furthermore, it was found possible to so vary the mass of a drop by varying the expansion, or the charge carried by a drop by varying the ionization, that drops carrying in some cases two, in some three, in some four, in some five, and in some six, multiples could be held suspended by nearly the same field. The means of gradually varying the field which had been planned were therefore found to be unnecessary. If a given field would not hold any drops suspended it was varied by steps of 100 or 200 volts until drops were held stationary, or nearly stationary. When the P.D. was thrown off it was often possible to see different drops move down under gravity with greatly different speeds, thus showing that these drops had different masses and correspondingly different charges.

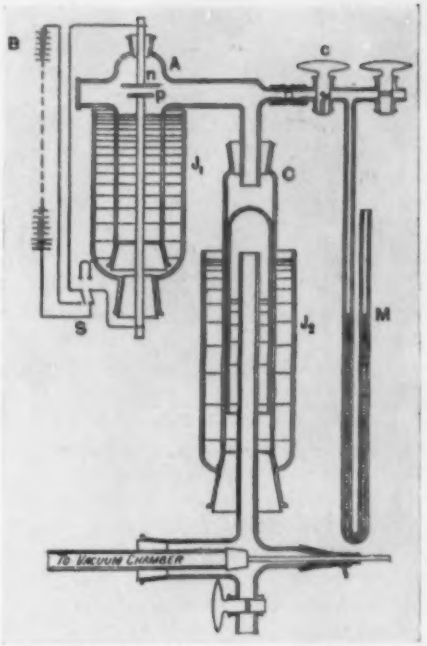
The life history of these drops is as follows. If they are a little too heavy to be held quite stationary by the field they begin to move slowly down under gravity. Since, however, they slowly evaporate, their downward motion presently ceases, and they become stationary for a considerable period of time; then the field gets the better of gravity and they move slowly upward. Toward the end of their life in the space between the plates, this upward motion becomes quite rapidly accelerated and they are drawn with considerable speed to the upper plate. This, taken in connection with the fact that their whole life between plates only 4 or 5 mm. apart is from 35 to 60 seconds, will make it obvious that during a very considerable fraction of this time their motion must be exceedingly slow. I have often held drops through a period of from 10 to 15 seconds, during which it was impossible to see that they were moving at all. Shortly after an expansion I have seen drops which at first seemed stationary, but which then began to move slowly down in the direction of gravity, then became stationary again, then finally began to move slowly up. This is probably due to the fact that large multiply-charged drops are not in equilibrium with smaller singly-charged drops near them, and hence, instead of evaporating, actually grow for a time at the expense of their small neighbors. Be this as it may, however, it is by utilizing the experimental fact that there is a considerable period during which the drops are essentially stationary that it becomes possible to make measurements upon the rate of fall in which the error due to evaporation is wholly negligible in comparison with the other errors of the experiment. Furthermore, in making measurements of this kind the observer is just as likely to time a drop which has not quite reached its stationary point as one which has just passed through that point, so that the mean of a considerable number of observations would, even from a theoretical standpoint, be quite free from an error due to evaporation.

The observations on the rate of fall were made with a short-focus telescope T placed about two feet away from the plates. In the eyepiece of this telescope were placed three equally spaced cross-hairs, the distance between the extreme ones corresponding to about one-third of the distance between the plates. A small section of the space between the plates was illuminated by a very narrow beam from an arc-light, the heat of the arc being absorbed by three water cells in series. The air between the plates was ionized by 200 mg. of radium, of activity 20,000, placed from 3 to 10 centimetres away from the plates. A second or so after expansion the radium was removed, or screened off with a lead screen, and the field thrown on by hand by means of a double-throw switch. If drops were not found to be held suspended by the field the P. D. was changed or the expansion varied until they were so held. The cross-hairs were set near the lower plates, and as soon as a stationary drop was found somewhere above the upper cross-hair, it was watched for a few seconds to make sure that it was not moving, and then the field was thrown off and the plates short-circuited by means of the double-throw switch, so as to make sure that they retained no charge. The drop was then timed by means of an accurate stop-watch as it passed across the three cross-hairs, one of the two hands of the watch being stopped at the instant of passage across the middle cross-hair, the other at the instant of passage across the lower one. It will be seen that this method of observation furnishes a double check upon evaporation; for if the drop is stationary at first, it is not evaporating sufficiently to influence the reading of the rate of fall, and if it begins to evaporate appreciably before the reading is completed, the time required to pass through the second space should be greater than that required to pass through the first space. It will be seen from the observations which follow that this was not, in general, the case.

It is an exceedingly interesting and instructive experiment to watch one of these drops start, and stop, or even reverse its direction of motion, as the field is thrown off and on. I have often caught a drop which was just too light to remain stationary and moved it back and forth in this way four or five times between the same two cross-hairs, watching it first fall under gravity when the field was thrown off, and then rise against gravity when the field was thrown on. The accuracy and certainty with which the instants of passage of the drops across the cross-hairs can be determined is precisely the same as that obtainable in timing the passage of a star across the cross-hairs of a transit instrument. . . .

Conclusion:

1. The temperature of the fog chamber a very few seconds after expansion



ELECTRONS ISOLATED HERE

Between the plates of this apparatus, Dr. Millikan saw the minute clouds formed in ionized gas, disperse into star-like points of light which he proved to be drops carrying from two to six electrons.

Chromosomes Bearers of Heredity

Will be the subject of the next Classic of Science by

Dr. THOMAS HUNT MORGAN

President of the American Association for the Advancement of Science

To be published in a coming issue

in the form of apparatus shown in the figure is essentially the temperature of the room.

2. The balanced drop method herewith presented for the determination of e involves an experimental error of not more than 2 per cent., and is entirely free from all theoretical uncertainties except such as are incident to the application of Stokes' law to liquid spheres of diameters varying from 30 to 50 times the mean free path of air molecules.

3. The results obtained by this method taken in connection with Rutherford's experiments seem to constitute experimental verification of Stokes' law for these drops.

4. Positively charged drops of water and alcohol are found by direct measurement to carry charges which are multiples of 4.65×10^{-10}, and all of the multiples from 2 to 6 inclusive have been obtained.

5. The mean of the five most reliable determinations of e is 4.69×10^{-10}. The corresponding value of n (the number of molecules in 1 cubic cm. of gas at 0° C., 76 cm. pressure) is 2.76×10^{19}; that of N (the number of molecules in a gram-molecule) is 6.18×10^{23}; that of eta ($= 3/2 \frac{RT}{N}$, the kinetic energy of agitation in ergs of a molecule at 0° C., 76 cm. pressure) is 2.01×10^{-16}; that of m (the mass in grams of an atom of hydrogen) is 1.62×10^{-24}.

Science News Letter, December 27, 1930

EXPLORATION

Shippe-Johnson Expedition To Explore Peru By Air

THE Shippe-Johnson expedition to explore Peru by air is now on its way to that country. The party of young adventurers and scientists will be gone four or five months during which time they hope to rediscover from the air Peru's arid coastal plain, the heights of the Andes, and jungles at the headwaters of the Amazon.

The members of the expedition, which is financed by private capital and is endorsed by the American Geographical and Harvard Geological Societies, are George R. Johnson, 30, former New York newspaperman, once chief photographer of the Peruvian Naval Air Service, leader; Robert Shippe, 20, co-leader, second pilot, geologist and historian; Irving G. Hay, 24, erstwhile tugboat captain of New York, chief pilot; Valentine Van Keuren, 30, civil engineer, and Max Distel, 24, mechanic.

The party plans to visit all points of geologic, archaeologic and geographic interest from Lake Titicaca, 11,500 feet up among the Andean peaks at the Bolivian border, to the sparsely settled gold country of the Maranon river watershed 1,100 miles to the north. Ruins of huge Inca edifices in southern Peru, notably near Hauraz and Cuzco, and Chan-chan, crumbled capital of the Grand Chimu, near Trujillo, will be pictured from above.

El Misti, the 20,000-foot world-famous quiescent volcano, is to be aerially mapped, as well as more than two score agricultural communities of the Colca valley, long isolated in the Andes and practically unknown even to Peruvians. Pictures of bird colonies on the guano islands along the Peruvian coast and of impenetrable jungles at the source of the Amazon, will also be taken.

Science News Letter, December 27, 1930

ONE GOAL OF THE AIR EXPEDITION

El Misti, 20,000-foot volcano in Peru to be mapped from air by five young explorers. Insert, George R. Johnson, 30, leader, once chief photographer for the Peruvian Naval Air Service.

CHILD CARE

Don't Let Junior Chew Paint From Toys

THE chewing of paint from toys, cribs, and woodwork constitutes a real danger to children, facts gathered by a life insurance company of New York indicate.

Chronic lead poisoning occurs much more frequently among infants and young children than has been generally supposed, the report declares, and it would be more prominent in sickness statistics but for the fact that it is often unrecognized by physicians.

The poisoning usually comes from the sucking or chewing of paint containing lead, although sometimes lead ointments on the breasts of nursing mothers are at fault.

Health officials agree that parents should recognize the danger from this source, and should prevent the paint-eating habit in infants or else select furniture and toys free of the poisonous lead.

Many of the new lacquers and enamels put on with the spray process avoid the use of lead bases, and one of the well known makers of children's toys advertises that their paints are absolutely harmless.

Perhaps the greatest danger lies in the home use of cheap paints containing a large proportion of lead.

Science News Letter, December 27, 1930

GENERAL SCIENCE

Scientific Achievements of 1930 Pass in Review

List of More than 200 Accomplishments Presents Notable Advances in All the Fields of Science

NOTABLE advances in all fields of science have been made during the past year.

The most outstanding event in astronomy was the discovery of the ninth planet of the solar system, Pluto, and this event alone is sufficient to give 1930 a special place in history. The discovery of the absorption of light in inter-stellar space is another important astronomical achievement.

The beginning of the conquest of Addison's disease by the hormone of the adrenal cortex gland is 1930's addition to the list of medical conquests through the advancing knowledge of endocrinology, which has in past years given insulin for use in diabetes and liver for use in pernicious anemia.

Man-made tools found this past year in close association with the remains of extinct ground sloths in a Nevada cave may indicate a greater antiquity of man in America than previously supposed.

The world mental hygiene congress held during the year ushered in a new era for the treatment of the mentally diseased.

An airplane climbed over eight miles into the air, a loftier height than man has hitherto achieved, and the Atlantic was crossed westward by airplanes and airship, one airplane making the difficult Paris to New York flight.

While the world's largest bridge across the Hudson River at New York was being erected, plans were laid for a longer span across the Golden Gate at San Francisco.

Among the many important developments of science during 1930 were:

Aeronautics

The highest altitude ever reached by man was attained by Lieut. Apollo Soucek, Naval flyer, when he climbed to 43,166 feet, more than eight miles.

The largest wind tunnel in the world and a covered body of water nearly half a mile long to serve as seaplane testing basin neared completion at the Langley Memorial Aeronautical Laboratory of the National Advisory Committee on Aeronautics, Langley Field, Va.

The difficult east-west crossing of the Atlantic was successfully made by Captain Dieudonné Coste and Maurice Bellonte in the Question Mark, flying from Paris to New York in 37 hours, 18 minutes.

An expanding rubber leading edge for airplane wings, called "airplane over-shoes," to prevent the formation of ice on the wings, was invented by Dr. William C. Geer, of Cornell University.

Captain Frank M. Hawks took just 12 hours, 25 minutes, 3 seconds to cross the continent from Los Angeles to Valley Stream, Long Island, setting a new record; the time included three stops of 15 minutes each.

The U. S. Bureau of Standards at Washington developed a radio landing beacon which enables planes to land safely in darkness or fog.

The world's largest airplane, the German DO-X, made successfully its first long distance flights, but was badly damaged by fire in Spain.

A new refueling endurance flight record was set by Forest O'Brine and Dale Jackson in the Greater St. Louis at 647 hours, 28 minutes, 30 seconds.

The Curtis Tanager, with its automatic wing slots and floating ailerons, won the $100,000 prize of the Guggenheim Safe Aircraft Competition.

The world record for duration without refueling was established by two Italian flyers, U. Maddalena and F. Cecconi, at 67 hours and 13 minutes; they also made the record for distance in closed circuit, 5,088.27 miles.

Dr. Hugo Junkers completed and put into operation his huge flying wing, a plane carrying more than three tons,

An unofficial world record for a duration flight in an engineless plane, was made by Jack Barstow at Point Loma in California, when he glided for 15 hours, 13 minutes in a sailplane.

The British airship R-101, the world's largest afloat, was destroyed by explosion in a storm in France.

Six world records were smashed at one time by the Italian flyer Domenico Antonini in a 6,000 hp. Caproni when he flew for 1 hour, 31 minutes, 39 seconds, reaching 10,597 feet, more than two miles, with a load of 22,046 pounds;

Boris Sergievsky in a seaplane powered with two 575 hp. engines reached the highest altitude, 26,929 ft., more than five miles, ever attained by a seaplane carrying pay load and also made the greatest speed for a loaded seaplane, 165.75 m. p. h.

A non-stop flight of 3,400 miles from Cardington, England, to Montreal, Canada, was made by the airship, R-100.

An unofficial world speed record for airships was set by the R-100 at 81. m. p. h.

The first attempt to come to earth on a glider launched from an airship, was successful when Lieut. R. S. Barnaby descended from the airship Los Angeles in this way.

Lieut. Apollo Soucek, repeatedly winner of altitude records, set a new maximum altitude for seaplanes at 39,140 feet, nearly seven and a half miles, not an official record.

With a flight from Ireland to the United States, Capt. Charles Kingsford-Smith and crew in the Southern Cross completed a trip around the world.

Captain Wolfgang von Gronau and three companions made the first east-west seaplane crossing of the Atlantic by way of Iceland and Greenland.

A non-stop flight from New York to Bermuda and return was made by Roger Q. Williams in the Columbia, the plane which Chamberlin and Levine flew to Germany, in 17 hours and 2 minutes, setting a record.

Anthropology and Archaeology

Excavations in the Gila Valley, Arizona, by the Los Angeles Museum, revealed very old cremation burials and traces of a link with cultures of Mexico.

A melting pot of prehistoric Pueblo and Plains Indian cultures was found along the Canadian River in Texas by Dr. J. Alden Mason of the University of Pennsylvania Museum.

An elaborate system of canals built by

LARGEST SUSPENSION SPAN

In the world neared completion across the Hudson river at New York during 1930.

MAYAS UNDERSTOOD FALSE PERSPECTIVE

It is shown by this nunnery in the ruined city of Uxmal, Yucatan, which was studied by archaeologists during 1930. The building is not square and level, yet it appears so.

Indian engineers in Arizona about 1200 A. D. was photographed and surveyed by an airplane expedition directed by Neil M. Judd, archaeologist of the U. S. National Museum.

In an almost inaccessible region of the Kuskokwim River, Dr. Ales Hrdlicka, of the Smithsonian Institution, found 3,000 living Eskimos belonging to the old, original type, quite unlike the present Eskimo.

The oldest settlement ever discovered in the Arctic was unearthed by Henry B. Collins, Jr., of the Smithsonian Institution.

Indian artifacts lying under a layer of ground sloth refuse were found by M. R. Harrington of the Southwest Museum, and were widely regarded as important evidence concerning early American inhabitants.

Six pyramids in a row were unearthed along the "Pathway of the Dead," at the ancient Toltec city of Teotihuacan by Mexican archaeologists.

Remains of a prehistoric culture not Aztec were found on the west coast of Mexico by Prof. C. O. Sauer of the University of California.

A prehistoric city known to have been one of the vassal-kingdoms of the Aztecs was explored by Mexican archaeologists.

Graves of distinguished members of the Tarascan tribe, prehistoric Mexican Indians, were found by an expedition from the Mexican National Museum.

Evidence that the Maya understood the false perspective was found at Uxmal buildings by the Tulane University Expedition; additional buildings and 19 important date stones were discovered at Uxmal.

Highly accurate predictions of eclipses of the sun and the moon were made by the Mayan Indians eight centuries before Christ, Dr. Herbert J. Spinden, of the Brooklyn Museum, discovered.

A Greek archaeologist, excavating at Ithaca, discovered a fountain which he considers definite evidence that this site was the Homeric city.

Excavations at Corinth continued by T. Leslie Shear of Princeton with discoveries shedding light on Corinth's trade relations.

Evidence of 1,000 years of Biblical history, from 1600 B. C. to 587 B. C., was found in a single mound at Tell Beit Misrim, in Judah, it was reported by Prof. William F. Albright.

The oldest known culture in the world originated by the so-called "Japhethite" peoples of nearer Asia, was reported by Prof. E. A. Speiser of the University of Pennsylvania.

A library containing important cuneiform tablets, even bilingual dictionaries and one in an unknown language, was found in northern Syria by the French Archaeological Mission to Ras Shamra.

A temple built by Nebuchadnezzar was found and other discoveries were made at Ur of the Chaldees by the expedition of the University of Pennsylvania Museum and the British Museum.

Meteorological balloons were first used in aerial photography of archaeological excavations by the Megiddo Expedition of the Oriental Institute clearing the mound of the ancient Armageddon in Palestine.

A tomb containing mummies of two Egyptian princesses was examined by the expedition of the Metropolitan Museum of Art, and a fine copy of the Book of the Dead was brought to America.

The greatest collection of Ptolemaic mummies ever found in one tomb was unearthed in a mastabah, or flat-topped tomb structure, at Meydum, the great national burying ground of the aristocracy of ancient Egypt.

The discovery of a tomb, called the largest private tomb found in Egypt, was made near the Sphinx at Giza by Prof. Selim Hassan Effendi of the Egyptian University.

Steps were taken which will enable American archaeologists to restore the ancient city of Persepolis, once a Persian capital.

In a cave on the west coast of Algeria where they were probably buried alive while asleep, a group of 39 prehistoric skeletons were found by archaeologists of the Beloit College-Logan Museum expedition.

Excavating at ruins of a city destroyed by the Mongol Genghis Khan, Russian archaeologists unearthed three successive cities, and found evidence of widespread trade relations in the Middle Ages.

Important scripts dating back to the first Han dynasty were found by the Sven Hedin Asiatic expedition.

Evidence of a cultured prehistoric race living in the far north of Mongolia which may have been the people called by the Greeks the "dwellers behind the north winds," was discovered by the Russian explorer, Prof. Peter Kozlov.

A second skull of *Sinanthropus* was recovered from material taken out of the limestone caves at Choukoutien, about 40 miles from where the original "Peking Man" skull was found in 1929.

Archaeological discoveries in China, including oldest stone sculpture ever found in the country, were reported from the first excavations ever conducted entirely by Chinese.

Astronomy

A new planet, the first to be discovered since 1845, was found photographically with a 13-inch telescope at Lowell Observatory in approximately the place predicted by the late Prof. Percival Lowell, founder of the observatory, who died in 1916. The planet, which is farther from the sun than any other yet discovered, was later named Pluto.

The discovery of seven comets was announced during the year, though one was not confirmed and another was a return of a periodic visitor. The first and fourth were discovered by Drs. Schwassman and Wachmann, of the Hamburg Observatory, Germany, though the former was independently found by L. C. Peltier, an amateur astronomer of Delphos, Ohio. The second was discovered by Beyer, also at Hamburg; the third by Wilk, of Cracow, Poland; the fifth by D. L. Forbes, of Rondebosch, South Africa; the sixth was the re-discovery of Tempel's second comet by Dr. George van Biesboeck, of the Yerkes Observatory and the seventh was by Nakamura, of the Kyoto Imperial University, in Japan. Efforts of American astronomers to find Nakamura's comet, which Japanese dispatches said had been observed by Sibata, of the same observatory, were unsuccessful, however.

Inter-stellar space, especially in the plane of the Milky Way, is not transparent, but filled with diffuse material that absorbs a considerable amount of light from distant stars, thus making the previous estimates of their distances too large, it was indicated by researches of Dr. R. J. Trumpler, of the Lick Observatory, supported by independent work of Dr. Piet van de Kamp, of the Leander McCormick Observatory.

A faint group of nebulae was found to be apparently speeding away from the earth at the rate of 7,200 miles a second, the highest astronomical speed yet recorded, by studies of Dr. Edwin P. Hubble and Milton L. Humason of Mt. Wilson observatory; but it is supposed that the effect is really an illusion, due to curvature of space.

The eccentric little planet Eros, which aids astronomers in determining the earth's gravitational power and the sun's distance, approached closer to the earth than it has at any time since its discovery in 1896.

Many stars are spinning at the rate of 40 miles a second, 150 times the speed of the earth at the equator, it was discovered by Dr. Otto Struve and Dr. C. T. Elvey of the Yerkes Observatory in collaboration with a Russian astronomer, Dr. G. Shajn.

An unusually large display of Leonid

meteors was visible on the early morning of November 17, suggesting the possibility of a brilliant shower in November 1932, 1933 or 1934.

The largest meteoric stone whose fall was observed and which has been recovered intact, an 820-pound meteorite, fell near Paragould, Ark.

Long range forecasting of weather may be made possible through the discovery by Dr. C. G. Abbot, secretary of the Smithsonian Institution, that there is a close correspondence between changes in the sun's radiation and in temperature at Washington, D. C.

The theory that stars have a structure similar to that of an egg, a dense yolk in the center, surrounded by a lighter material, was advanced by Prof. E. A. Milne, Oxford University, England.

A new theory of the construction of the universe, that it constitutes a huge system made by the condensation of a loose swarm of smaller clusters of stars which were originally like the spiral nebulae, was proposed by Dr. Harlow Shapley, director, Harvard College Observatory.

The surface of the moon is apparently covered with volcanic ash, researches with polarized light conducted by Dr. B. Lyot of the Paris Observatory indicate.

The theory that the earth may have a comet-like tail sometimes visible as a faint patch of light called by astronomers the "Gegenschein," was advanced by Dr. E. O. Hulburt, of the U. S. Naval Research Laboratory.

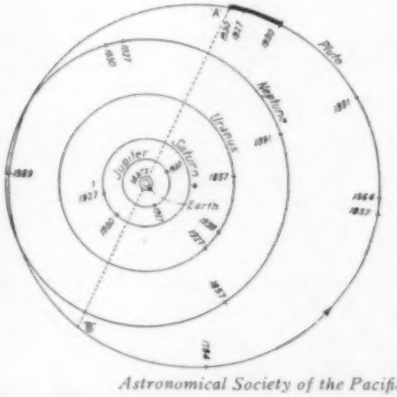
On April 28 the United States saw its first total eclipse of the sun since 1925 when the shadow of the moon just touched the earth on a path which passed through California, Nevada, Idaho, and Montana.

A total eclipse of the sun on October 21 was witnessed by two parties of astronomers from tiny Niuafou Island in the Pacific.

The length of Neptune's day was found by Dr. J. H. Moore of Lick Observatory to be about 16 hours.

A new 50-foot interferometer, a giant instrument for the measurement of the diameter of stars, was completed at Mt. Wilson Observatory in California.

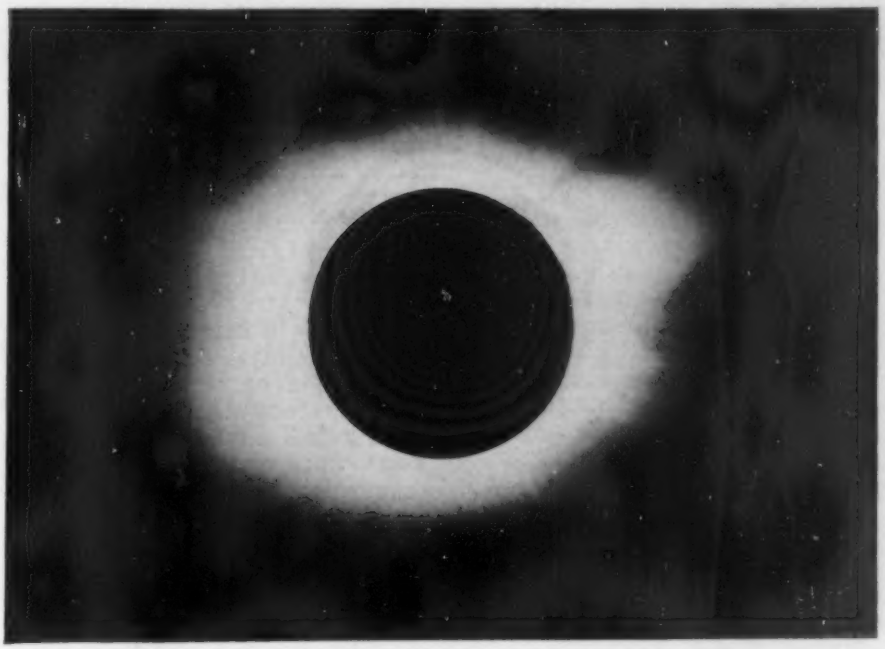
Arsenic and germanium are both present in some meteorites that fall to the earth, it was discovered by Dr. Jacob Papish and Zaida M. Hanford, Cornell University chemists.



Astronomical Society of the Pacific

WHERE PLUTO TRAVELS

The new plant was discovered during the past year and its orbit calculated from positions on old photographic plates which were revealed by careful examination.



LATEST PICTURE OF THE SUN IN ECLIPSE

Taken during the past fall at Nivafou Island in the South Pacific ocean.

America's first planetarium, in which the observer may at will see a facsimile of the heavens as they look at any time and from any place, was opened on May 10 at Chicago.

A daily broadcast of cosmic data, including number of sun spots, solar radiation constant, and data on magnetic disturbances, was inaugurated by Science Service with the cooperation of the International Scientific Radio Union.

Biology

Quarantine restrictions on Florida fruit and vegetable shipments, designed to prevent the spreading of the Mediterranean fruit fly, were wholly removed on November 15.

The plant breeder who originates a new variety of plant propagated by asexual or vegetative means was given, by act of Congress, the right to a patent of his living product.

The world's largest fish hatchery was completed near Lonok, Arkansas, for the propagation of the warm-water nest-building fishes, such as bass and bream.

A new instrument, a modification of the interferometer, was devised by Prof. K. W. Meissner of Frankfort, Germany, making it possible for the first time to see a plant grow.

A swarm of locusts appeared across northern Africa, from Egypt almost to Gibraltar, and extended into the Near East and Balkans.

That the fungus of black stem rust is capable of producing hybrids and thus multiplying the strains which attack wheat, was discovered by Dr. J. H. Craigie of the Dominion Experimental Farms at Winnipeg.

Two sets of human identical triplets were reported by Alfred E. Clarke and Daniel G. Revell, biologists of the University of Alberta, Canada.

Animals can manufacture the growth-promoting vitamin A in their bodies from carotin, it was found by Dr. Thomas Moore, Cambridge, England.

A herd of 30 musk-oxen was transplanted from Greenland to Alaska by the U. S. Department of Agriculture in an effort to reestablish them in the latter country.

Dr. J. Markowitz and Dr. H. E. Essex of the Mayo Foundation were successful in keeping alive the internal organs of an animal for 12 hours after the animal had died.

Man lowered himself farther into the ocean depths than ever before when William Beebe and Otis Barton descended 1,426 feet in a steel sphere off the coast of Bermuda.

Chemistry

The existence of rotating molecules in solid compounds was reported by Prof. Linus Pauling, of the California Institute of Technology, and Dr. Sterling B. Hendricks, of the Fixed Nitrogen Laboratory, U. S. Department of Agriculture; this discovery has an important bearing on the heat capacities of solids.

The magnetic susceptibility of samarium sulphate octohydrate was announced by Simon Freed, of the University of California, arousing great interest among chemists because the discovery indicates the possibility of electronic isomers in the solid state.

The chemical puzzle of the structure of the crystal of the silicates was solved by William L. Bragg, Victoria University of Manchester, England, and Linus Pauling, of the California Institute of Technology.

A new gas for use in electric refrigerators, non-poisonous and non-inflammable, which is a compound of carbon, chlorine and fluorine, was the invention of Thomas Midgley, Jr.

Carotin, the stuff that makes some foods yellow, is important for nutrition as well as the green chlorophyl, because vitamin A is associated with this color in vegetables, butter, and egg yolk, it was discovered by S. M. Hauge and J. F. Trost of the Purdue University Agricultural Experiment Station.

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ARCHAEOLOGY

Gifts of Wise Men Featured in Exhibit

GOLD, frankincense, and myrrh,—Christmas gifts brought by the Wise Men, St. Matthew tells, to the cradle of the Christ Child—are being shown in Philadelphia in the form in which they would naturally have been offered in those days. The exhibit has been arranged by the Academy of Natural Sciences of Philadelphia.

The appearance and value of gold are familiar enough today. But frankincense and myrrh are little more than names to the modern giver of Christmas gifts.

Frankincense is shown as a gum obtained from an East African tree. The gum was sought by the Egyptians for use in religious rites, and was also used as a fourth part of the incense in the Hebrew sanctuary. When burned it had a sweet odor, and in some parts of the East it was used as a medicine.

Myrrh, also a gum, was obtained from a small tree that grows in eastern Africa and in Arabia. As perfume and temple incense, myrrh was greatly esteemed by the ancients. Throughout the Orient it has long been regarded as a sovereign remedy for the relief of pain.

Science News Letter, December 27, 1930

ZOOLOGY

Cannibalistic Mouse Is Farmer's Friend

A FIERCE mouse, that lives by hunting and often kills and eats other mice, has been studied by Vernon Bailey and Charles C. Sperry of the Biological Survey, U. S. Department of Agriculture. There are several kinds of this hunting mouse, but they all look pretty much alike, and they are all grouped together in the genus *Onychomys*. This formidable-looking Greek name means simply, "a mouse with claws"—though their claws are not much longer than those of other mice.

In the West, where this mouse is common, it is known as the grasshopper mouse, for its chief prey is grasshoppers. In captivity it thrives perfectly well and is apparently contented if it gets plenty of these long-legged insects. But if a mouse of another genus is put into the cage in the evening, there will be only one animal there in the morning—and maybe a few scraps of fur in the corner. Onychomys will have killed and eaten his cage-mate.

The appetite of these stubby-tailed little mice is astonishing. The two investigators tell of one that ate another mouse of almost its own size during the night. The next night it ate another, about half its size, and the third night a third mouse, about as big as the first one was. On the fourth morning, in spite of three heavy cannibalistic banquets in succession, it breakfasted on three large grasshoppers and some rolled oats.

Obviously, a mouse of this kind is to be regarded as the farmer's friend instead of as an enemy. A mouse a night, or twenty grasshoppers, which seems to be fair rations for twenty-four hours, represents a really considerable contribution in the way of pest removal.

Science News Letter, December 27, 1930

ASTRONOMY

Brilliant Meteor Shower Seen From Ship at Sea

AN "immense shower of meteors," or shooting stars, coming as fast as 12 to 15 a minute, was observed in the early morning hours of November 17 from a ship in the Atlantic Ocean near Porto Rico by Second Officer G. T. Bieling, of the American steamer Annetta. One was a brilliant fireball, that exploded in a flash so bright that an excellent flashlight photograph could have been taken by its light. This body left a luminous trail visible for 25 minutes afterwards.

In a report of the occurrence to the U. S. Navy's Hydrographic Office, Mr. Bieling said that the display of the meteors lasted from about midnight, eastern standard time, to dawn.

This was the time of the regular November meteor shower, known to astronomers as the Leonids (SCIENCE NEWS LETTER, Nov. 29, Nov. 8, 1930) because they seem to radiate from the constellation of Leo, the lion. Great showers of Leonid meteors were seen in 1799, 1833, and 1866.

Mr. Bieling's report indicates that the Leonid shower this year was even greater than was supposed at the time. It is hardly likely that the maximum shower of Leonids would come as early as 1930, so the great cluster of Leonid meteors is probably approaching the earth's orbit. If this is the case, the next few years should see increasingly greater showers, with a really magnificent one about 1932 or 1933.

Science News Letter, December 27, 1930

IN SCIENCE

VOLCANOLOGY

Merapi, Now In Eruption, Has Long Activity Record

MERAPI, Javanese volcano whose eruption has been responsible for a number of deaths during recent days, has a long record of activity. During the past century there have been at least 37 eruptions, and less continuous data tell of outbreaks known to Europeans as early as 1678.

Three times in the past Merapi has claimed human victims. In 1822 an eruption killed 20 persons, in 1832 there were 32 deaths, and, in 1904, 12 lost their lives. An eruption in 1849, while not causing any fatalities, was especially destructive to property.

Merapi is one of those volcanoes that tends to build up a plug or stopper of lava in its crater. This confines the energies of its activity, and tends to make them accumulate and finally burst forth explosively.

On Sumatra, another volcano by the same name, Merapi, suddenly burst into activity at the same time, killing a brilliant young German volcanologist, Prof. Werner Borchardt, together with his assistant.

Science News Letter, December 27, 1930

AQUICULTURE

Cottonseed Meal Used As Fish Feed

ALTHOUGH few fishermen would care to bait their hooks with a string of cottonseeds, it has just been found in the animal nutrition laboratory of Cornell University at Ithaca, N. Y., that cottonseed meal is one of the most satisfactory of the plant products for rearing brook trout.

The meal cannot be fed alone but is mixed in equal parts with dry skim milk and a good fish meal. This dry feed is made into a paste with water and combined with a small amount of raw meat before the fish dietitian casts it to the hungry trout. Among a great many plant foods which have been studied, cottonseed meal excels.

Science News Letter, December 27, 1930

E FIELDS

MEDICINE

Plant Extract Disguises Bitter Taste of Strychnine

AN extract of a plant called yerba santa or mountain balm was found to be the most effective of several chemicals in disguising the bitter taste of strychnine, Justus C. Ward and James C. Munch of the U. S. Bureau of Biological Survey have reported to the American Pharmaceutical Association. The latter drug, while it is a very strong poison, is used medically in very small amounts, chiefly as a tonic.

Salts and sucrose also masked the taste of the strychnine, but to a less extent than yerba santa. Sodium bicarbonate, on the other hand, increased the bitterness. Taste buds for detecting bitterness are located on the tip as well as on the base and sides of the tongue, the investigators reported.

Science News Letter, December 27, 1930

MARINE BIOLOGY

Young Oysters Attracted By Bag of Old Shells

IF OYSTERS ever again become as abundant as we'd like to see them, we shall have to thank the Bureau of Fisheries, U. S. Department of Commerce, in large part for the increase. Three Bureau scientists, P. S. Galtsoff, H. F. Prythearch and H. C. McMillin, have just reported their success in finding methods to induce wandering young oysters to settle down and build homes and raise families of their own.

When an infant oyster is hatched from its egg, it is microscopic in size, or nearly so. It is as naked as other infants, having no trace of the solid limestone shell it is later to build about itself. And like many other members of the younger set, it is restless and wants to wander aimlessly. During this period the young oysters are known by the somewhat belittling-sounding name of "spat."

Only after it has had its fling does the young oyster consent to take hold of something solid and settle down to real, dependable oysterhood and grow a proper shell. It will then use almost anything solid for an anchorage, however, a favorite settling site being the empty shell of a departed oyster.

The three Bureau of Fisheries men fashioned great bags out of coarse chicken wire, filled them with empty oyster shells, and sank them in shallow waters where the oyster spat were thick. They found that these molluscan apartments were attractive to the homeless oysterlings, which took hold in encouraging numbers. Then the wire-netting bags were hauled up on board the boats again and removed to other shallow waters where repopulation with oysters was desirable.

Science News Letter, December 27, 1930

PLANT PATHOLOGY

New Disease of Onions Conquered in Three Years

YELLOW dwarf, a new virus disease of onions which made its first appearance in the Pleasant Valley, Iowa, onion growing district during the season of 1927, has been brought under control by Dr. I. E. Melhus and W. J. Henderson, both of the plant pathology department of Iowa State College.

The new disease is characterized by a dwarfing of the entire plant and a crinkling, yellowing and drooping of the leaves; it belongs to the filterable virus group of diseases. Yellow dwarf is carried over from season to season in the bulbs, but is not seed or soil borne. It is transmitted from diseased to healthy plants by some unknown agent.

During the season of 1928 there was a monetary loss of $203,152, due to the yellow dwarf disease. In 1929 the loss was reduced to $95,663 and for the 1930 season the loss was $2,895.

This reduction in the amount of loss caused by the yellow dwarf disease was brought about by indexing the onion sets and mother-bulbs and growing them in greenhouse beds. The percentage of infection for each grower's lot of bulbs was indexed. Growers with a high percentage of infected plants were advised to buy sets from neighbors who had disease-free plants. They were further advised to grow their sets in a district free from the infection.

Since yellow dwarf is not carried over from one season to the next in the seeds, it is possible to grow healthy sets from seed from diseased plants, if they are grown in an area that is free from infection, says Dr. Melhus.

Science News Letter, December 27, 1930

PLANT PATHOLOGY

Paraffin Saves Bananas From Stalk Decay

BANANAS can be saved from one of their most costly types of spoilage by the simple trick of anointing the cut end of the stalk with paraffin. This discovery has been made as the result of a joint research conducted at Cambridge, England, by R. G. Tompkins of the Low Temperature Station and Dr. R. M. Woodman of the School of Agriculture.

One of the most serious causes of spoilage in bananas is rotting which spreads from the cut stalk. Moulds grow where the stalk is cut and cause rot. If the mould growth in the cut stalk could be prevented, this form of spoilage would disappear. The same type of rot is also found in pineapples and melons.

Mr. Tompkins and Dr. Woodman treated the cut stalks of bananas with a number of substances to see whether mould growth could be prevented in this way. Fungicides proved to be practically useless. Borax, copper sulphate, corrosive sublimate, formaldehyde and potassium permanganate, all of which usually destroy fungi, were not able to prevent the rot of bananas.

Excellent results were obtained, however, with substances which block the surface of the cut stalk mechanically Thus there was no subsequent rotting if the banana ends were dipped in melted paraffin wax. The rotting was also considerably reduced when the banana ends were smeared with vaseline.

Science News Letter, December 27, 1930

MEDICINE

Malaria Remedies "Tried on the Bird"

THE old injunction, to "try it on the dog first," is modified to "try it on the bird" in present-day malaria laboratories. At the Wellcome Chemical Research Laboratories, London, where remedies for tropical diseases are constantly under investigation, Dr. T. A. Henry and associates are taking advantage of a fact discovered many years ago, that birds as well as men are subject to malaria. So birds are being tried out as experimental animals for proposed new malaria cures, in place of the time-honored guinea-pigs, rabbits and dogs.

Science News Letter, December 27, 1930

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(*Continued from page* 411)

Bacteria obtained from brewer's malt may now be pressed into the service of the chemist to eat away the cell walls of plant tissue and liberate the vegetable oil, according to a method developed by John Woods Beckman, Oakland industrial chemist.

A device for removing carbon monoxide from the exhaust gases of an automobile by means of a catalyst was demonstrated by the inventor, Dr. J. C. W. Frazer of Johns Hopkins University.

The richest source of helium yet discovered, a natural gas in southeastern Colorado containing 7 per cent. of helium, was reported by F. F. Hintze, of the University of Utah.

Crystals of rubber were obtained for the first time in the chemical laboratories of the U. S. Bureau of Standards.

The U. S. Pharmacopoeial Convention, which meets once in ten years to decide on the contents of the Pharmacopeia or standard for drugs and chemicals, met in Washington in May.

Engineering

After a third attempt, Prof. Georges Claude was successful in obtaining power from the temperature difference in the ocean water at the surface and in the depths of the tropical seas off the Cuban coast.

The two longest steel arches in the world were closed; the Kill Van Kull bridge at New York with a 1,675-ft. span and the Sidney harbor bridge, Australia, 1,650-ft.

An elevated Monorailway 30 miles long carrying a propeller-driven car which travels 120 miles per hour was completed near Glasgow, Scotland.

Application of the hydrogenation of crude oil, which greatly increases production of gasoline was extended.

The city gas business was further invaded by natural gas and its by-products, propane and butane, and petroleum refinery gas; natural gas being piped as far as 1,000 miles to centers of population.

Construction progressed on the world's largest hydro-electric power plant, the Dneprostroy project in Russia, which will have an ultimate capacity of 750,000 hp. and on the largest hydro-generators, 77,500 kilovolt-ampere capacity, and turbines, 84,000 hp. capacity.

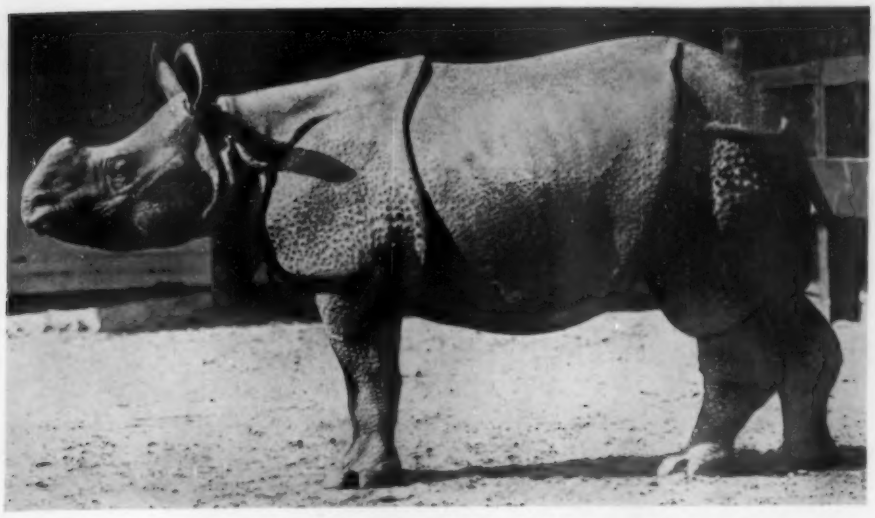
Final work was done on the new Welland canal, a mammoth structure built by Canada to pass sea-going lake grain vessels up and down the 326.5-foot difference in elevation between Lake Erie and Lake Ontario.

Plans were made and bonds authorized for the $35,000,000 Golden Gate Bridge at San Francisco, the center suspension span of which will be 4,200 feet, the longest in the world.

U. S. Department of Interior began preliminary field work on the construction of the 730-foot Hoover Dam, world's highest, a part of the Boulder Canyon project on the Colorado river.

The Detroit-Windsor vehicular tunnel, connecting Canada and the United States beneath the Detroit river, was opened to traffic.

An experimental boiler designed to operate at pressures ranging from 3,500 to 4,500 pounds per square inch and a temperature of 833 degrees Fahrenheit was built.



THE RAREST RHINOCEROS IN THE WORLD

And one of the rarest of all large animals, is now at home in the Carl Hagenbeck Zoo at Stellingen, Germany. It is the only armored rhinoceros that has ever been brought to the Occident. It comes from a protected range in the lower Himalayas, in Sikkim, Assam and Nepal. It is estimated that only 300 specimens of this animal are left alive. The armored rhinoceros resembles the one-horned Indian rhinoceros in most respects, except that its hide is studded all over with a multitude of little bony plates, making it proof against any kind of missile except a steel-jacketed bullet.

A severely streamlined railway car driven by a 400 hp. airplane engine and propeller sped more than 100 miles per hour on a straight track in Germany.

Construction progressed on the Ft. Lee 3,500-ft. span suspension bridge across the Hudson river at New York and the 1,500-ft. Mid-Hudson suspension span at Poughkeepsie.

The application of welding to steel building construction was greatly extended, the number of such buildings being increased 50 per cent.

The world's longest concrete arch bridge was built at Brest, France, with three spans, each of 612 feet.

The *Europa*, new German ocean liner, entered service and became speed queen of the North Atlantic by bettering the record of her sister ship, the *Bremen*.

The U. S. Bureau of Standards prepared for the construction of a National Hydraulic Laboratory provided for by Congress at a cost of $350,000.

Coolidge Dam across the Gila river canyon near Globe, Ariz., a dam of unusual construction making use of multiple domes, was dedicated by the ex-president for whom it was named.

The first roller-bearing locomotive was built and put in service.

The Keenan Steam Tables and Mollier Diagram, which for the first time tabulate and graphically present the properties of steam at the higher temperatures and pressures at which it is now being used in large power plants, was published by the American Society of Mechanical Engineers.

Chicago's Merchandise Mart, said to be the largest building in the world, was completed.

The U. S. Patent Office issued 49,599 patents and accepted 117,790 applications during the fiscal year ending in June.

Construction advanced on the world's largest high pressure turbine-generator, a 110,000 kilowatt steeple compound unit to operate at 1,200 pounds per square inch pressure in the River Rouge power plant near Detroit.

The highest boiler pressure ever used in America, 1,800 pounds per square inch, was employed in a 6,000 kilowatt power plant nearing completion at Lockland, Ohio.

A radio telephone service was installed between New York and Buenos Aires, making possible the connection by radio phone of four continents—North America, South America, Europe and Africa.

The first completely welded ocean-going cargo vessel was launched at Charleston, South Carolina.

The world's first floating power plant, the S. S. *Jacona*, with a generating capacity of 20,000 kilowatts, was placed in service along the New England coast as a source of emergency power.

A new field gun mount, enabling a 75 millimeter cannon to be trained at any point in a complete circle and elevated to any angle up to the vertical, was developed by the U. S. Army.

Work began on the Rogue river concrete arch bridge in Oregon, the first bridge in America to use elastic piers.

Plans were announced for the restoration of a canal built by George Washington around Great Falls on the Potomac river as a part of the Washington Bicentennial Celebration of 1932.

Progress in the design of windowless buildings lighted and ventilated entirely by artificial means was made and plans were announced for the construction of a $1,500,000 windowless factory at Fitchburg, Mass.

Photographic films taken by the Andrée polar balloon expedition more than 30 years ago were found with the explorers' remains and developed and printed successfully in spite of deterioration by age and exposure.

Geology and Geography

The decennial census of the United States was made, showing the population to be 122,775,046.

The most severe drought and hot season recorded by the Weather Bureau gripped practically the whole of the United States from June until mid-autumn, causing severe damage to crops and range lands and bringing new records for low water in the rivers.

A landslide destroyed part of the city of Lyons in France, taking many lives and destroying much property.

Great deposits of fossil mammal and bird bones were found in Wyoming.

Fossils of a redwood species were discovered on St. Lawrence Island in Bering Straits, bridging the gap between previously known occurrences in Asia and North America.

Huge deposits laid down in Pre-Cambrian times were found in the Grand Canyon of Arizona.

The Polish Academy of Science announced the discovery of the complete body of an Ice-Age rhinoceros, with muscles and skin complete and in place, in the frozen soil of the district of Starunia, Poland.

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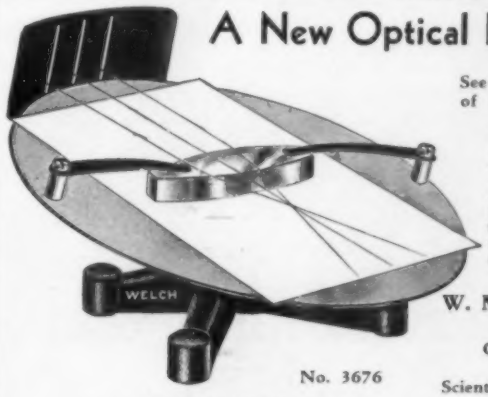

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There is a real need for a book which selects, organizes and presents biological material from the point of view of the teacher in training. This book supplies that need. The first part is more or less pure biology and is the foundation for part II which includes the application of the principles of biology to education. A bibliography is included.

It is no longer necessary to justify the place of biology in modern education. Wherever we turn we see that biological science has become the very foundation stone of our modern life. More important than radio, gasoline, steel, dyes, synthetic chemistry, it is the increasing regard for physical and mental health, longevity, and a declining birth rate.

The author says, "we are in quest of the natural instincts and tendencies that may serve as motives in education, and, no doubt, we shall find them. Then the entire curricula, from kindergarden to college, will be built around a core of scientific studies. This will come only when our teachers and our prospective teachers have made themselves familiar with the scientific method and the laws and principles upon which such a study rests.

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The bodies of S. A. Andrée, pioneer aerial explorer of the Arctic, and his two companions were found, with Andrée's diary and other important historic documents, on White Island, Fridtjof Nansen Land.

The rebuilding of a submarine was begun for use by an Arctic expedition planned by Sir Hubert Wilkins.

Seismological reports of 29 earthquakes were collected and epicenters located by Science Service with the cooperation of the U. S. Coast and Geodetic Survey and the Jesuit Seismological Association; these included 15 violent shocks, six of which were destructive on land in Italy, Japan, India, Persia, Guatemala and Chile.

Medicine

A hormone from the cortex of the suprarenal glands was isolated by Drs. W. W. Swingle and J. J. Pfiffner of Princeton University and used by Drs. Leonard G. Rowntree and C. H. Greene of Mayo Clinic to treat hopeless victims of Addison's disease, in the same way that insulin affects the coma of diabetes. Drs. F. A. Hartman and Dr. K. A. Brownell of the University of Buffalo also obtained an extract of the same gland.

The filterable virus germ which causes multiple sclerosis, or "creeping paralysis," was discovered with the aid of a special ultramicroscope at a magnification of 1,800 diameters by Sir James Purves-Stewart and Kathleen Chevassut of the Westminster Hospital, London.

An artificial lung, or respirator, was invented by Drs. Philip Drinker and L. A. Shaw of the Harvard School of Public Health, to keep alive patients whose breathing muscles are paralyzed in infantile paralysis or who are victims of gas poisoning.

A new method for studying the microscopic growth of living tissue in a warm-blooded animal was developed at the University of Pennsylvania School of Medicine.

An enzyme which has both protective and curative action on Type III pneumonia in mice, and possibly also in man, was extracted from a bacillus found in the soil of New Jersey cranberry bogs.

Vitamins in sufficient amounts will prevent infection of animals, and possibly man, with leprosy, it was reported by Dr. J. Shiga, dean of the Imperial Medical Faculty, Seoul, Korea.

Fever produced by short radio waves was found helpful in the treatment of paresis by Prof. T. W. Richards of Princeton.

The National Institute of Health was created by act of Congress replacing the Hygienic Laboratory of the U. S. Public Health Service.

Cancer studies were reported by numerous investigators. Drs. Walter B. Coffey and John B. Humber of San Francisco announced a method of treating cancer by injection of a glandular extract. Drs. Shigemitsu Itami and Ellice McDonald of the University of Pennsylvania reported they were unable to cure cancer in mice by this method. Dr. Frederick S. Hammett of Philadelphia found that the application of partly oxidized sulfur compounds caused tumors in mice to disappear.

Experiments proving that the common cold is caused by a filterable virus were reported by two groups of investigators: Dr. Gerald S. Shibley, Katherine C. Mills and Dr. A. R. Dochez of the Columbia University College of Physicians and Surgeons and the Presbyterian Hospital of New York; and Drs. Perrin H. Long and James A. Doull of the Johns Hopkins Medical School.

An extensive outbreak of psittacosis, popularly known as parrot fever, occurred in the United States and many other countries. In this country 169 cases with 33 deaths were reported. Investigators of the U. S. National Institute of Health made an extensive study but did not find the *Bacillus psittacosis* which a French scientist, E. Nocard, had reported as the causative germ in 1892. They concluded that the disease was caused by a filterable virus. They did find an organism which might be the cause of the disease, but it was not *B. psittacosis* or any other member of that germ family.

A phenol compound, tri-ortho cresyl phosphate, was found by the U. S. Public Health Service to be the adulterant which caused thousands of cases of partial paralysis from drinking bootleg Jamaica ginger, known as "ginger jake."

A new chemical method of standardizing ergot, widely used in childbirth, was devised by Dr. M. I. Smith of the National Institute of Health, formerly the U. S. Hygienic Laboratory.

A large increase in the number of cases of infantile paralysis, almost reaching epidemic proportions, occurred during the fall of 1930.

The time required for blood to clot, vitally important in surgical operations, is shortened by feeding the patient vitamin D, it was discovered.

Study of the chemical changes taking place in the brain was made possible for the first time through a technical procedure developed by Dr. Abraham Myerson of Boston, whereby blood is taken from the artery leading to the brain and from the vein which drains the brain and the chemical contents of the two samples compared.

New hope for recovery of child victims of serious burns was given by treatment, making use of a tannic acid solution, devised by Dr. Edward C. Davidson of Detroit.

Radio waves, shorter than those commonly used for sending messages, are able to weaken materially the poison elaborated by the diphtheria bacillus, it was discovered by Drs. Waclaw T. Szymanowski and Robert Alan Hicks of the Western Pennsylvania Hospital Institute of Pathology.

A new method for measuring the heart's output of blood by determining the amount of acetylene gas taken up by the lungs in a certain time was devised by Dr. Arthur Grollman of the Johns Hopkins University.

An international birthday party, with the celebrations round the world united by radio, was given in honor of the 80th birthday on April 8 of the "dean of American medicine," Dr. William Henry Welch.

The three hundredth anniversary of the first use of cinchona bark, from which quinine is obtained for the treatment of malaria, was celebrated.

To study the problems of the American child, scientists from all over the country at call of President Hoover met in a White House Conference on Child Health and Protection, at Washington, Nov. 19 to 22.

The flarimeter, an instrument which will disclose whether a person has heart disease in advance of serious developments by measuring shortness of breath, was demonstrated by Dr. P. V. Wells of Newark, N. J.

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A new barbituric acid derivative, the sodium salt of isoamylethylmalonylurea, was discovered and found to be valuable to the surgeon in producing a state just short of deep sleep.

Calcium gluconate, formerly only a laboratory curiosity, was discovered to be an effective medicine.

Physics

A new theory of the universe, assuming that it is non-static and consisting of matter dissipating through radiation, was propounded by Dr. Richard C. Tolman, of the California Institute of Technology.

The theory that cosmic rays are not rays at all but high velocity particles was advanced by two German physicists, Dr. Walter Bothe of Berlin and Dr. Werner Kolhoerster of Potsdam, as a result of experiments they have conducted with a specially built adaptation of the electron counter, but researches of Dr. R. A. Millikan on the intensity of cosmic rays near the north magnetic pole, provide evidence against the theory.

The theory that cosmic rays consist of high-velocity particles, like tiny bullets, was supported by experiments conducted by Dr. L. F. Curtis of the U. S. Bureau of Standards in which he used two electron counters.

Dr. R. A. Millikan found that measures of the intensity of the cosmic rays provide a good means of determining the amount of atmosphere above a point on the earth, so that the cosmic ray electroscope may be used as a form of barometer.

The final value for the most accurate measurement ever made of the constant of gravitation was announced after seven years' work by Dr. Paul Heyl, physicist of the U. S. Bureau of Standards, to be the fraction 6.670 over 100,000,000.

Artificial gamma rays, which may take the place of radium in the treatment of cancer, are produced by a giant vacuum tube operating at 700,000 volts, at the California Institute of Technology.

The theory that the sun is lighted like a giant electric bulb by electricity under pressure of ten million volts flowing from inside the sun and heating its atmosphere to incandescence, was advanced by Dr. Ross Gunn, U. S. Naval Research Laboratory.

A new physical concept, the paradoxical one that two separate particles of matter can be completely identical was enunciated by Prof. Gilbert N. Lewis, of the University of California.

That space is not empty but filled with electrons of minus or negative energy, was suggested by Dr. P. A. M. Dirac of Cambridge, England.

The possibility that the whole universe is fading away so that in some timeless future no matter will remain, only radiation, was indicated by calculations made by Dr. Louis S. Kassel, of California Institute of Technology.

A new type of clock controlled electrically by a vibrating crystal, thus dispensing with a pendulum, has been developed under the direction of Dr. W. A. Marrison, of the Bell Telephone Laboratories.

A moulded compound, including silicon carbide or carborundum, which has the quality of preventing the flow of electricity at low voltages while allowing it to pass at high

A YELLOW CALLA LILY

Of unusual development in the garden of Charles H. Hamilton, of Pasadena. The two broad leaves that subtended the flowers were as yellow as the spathes themselves. The offspring of these plants were carefully watched, but the new character proved to be non-hereditary.

potentials, was developed at the laboratories of the General Electric Company.

The method by which the diameters of stars have been measured through the interference of light waves was applied to the extremely accurate measurement of terrestrial distances in an instrument developed by Stuart H. Chamberlain of Michigan State College.

A device for measuring the intensity of ultraviolet rays by means of an ultraviolet-sensitive photoelectric cell connected with a condenser, which as it discharges operates a counter, was developed in research laboratories of the Westinghouse Lamp Co.

Alternating electric current is more dangenerous at low voltages than at high, it was discovered through experiments on rats at Johns Hopkins University: with the ordinary house potential of 110 volts, 100 milliamperes will cause death.

Electric current direct from sunlight was made possible through the invention by Dr. B. Lange, of the Kaiser Wilhelm Institute for Silicate Investigation, of a new type of cell containing copper oxide between two layers of metallic copper.

Dr. Ernest O. Lawrence of the University of California, with his associate, Dr. N. E. Edlefsen, devised a method for increasing the speed and energy of the protons or hearts of hydrogen atoms so that it may be possible when the method is further perfected to use them as atomic projectiles for smashing the hearts of other atoms, transmuting them into other substances or releasing enormous quantities of atomic energy.

A method of taking photomicrographs by long wave ultraviolet light through an ordinary glass lens, was discovered by Dr. A. P. H. Trivelli, of the Eastman Kodak Co., and Leon V. Foster, of the Bausch and Lomb Optical Co.

An electric photoflash lamp, a German invention, for taking flashlight photographs without noise or smoke was introduced in the United States, the light being made by aluminum foil ignited electrically in a bulb full of oxygen.

Psychology and Psychiatry

Slow motion pictures enabled Dr. Knight Dunlap and G. H. Mowrer of Johns Hopkins University to analyze the motion of a chicken's head in walking and to find that the head jerks forward only, serving to give the fowl clearer vision.

The First International Mental Hygiene Congress met at Washington from May 5 to 10 with 2,000 specialists in attendance.

Diseases suffered during childhood set a definite mark on personality, Dr. H. W. Newell of Richmond, Va., found by a study of identical twins.

A psychiatric service to assist judges in determining sentences of convicted offenders was recommended by the committee on psychiatric jurisprudence of the American Bar Association.

Mental disease shortens life to a startling degree, it was found by Dr. Neil Dayton and Dr. Carl Deering, of Boston, who discovered that the individual's expectation of life is reduced two-thirds by psychoses.

Statistical methods applied to psychiatry by Prof. Thomas V. Moore, of the Catholic University of America, in an effort to chart exactly the symptoms of various mental diseases, determined the existence of 41 different symptoms.

Genealogical studies at the German Research Institute for Psychiatry, Munich, reported by Prof. E. Rudin, showed that among families having one parent afflicted with manic-depressive insanity, at least a third of the children will be similarly afflicted, and another third will be otherwise mentally abnormal.

A service whereby the job-seeker may take tests and obtain an authentic credential to present to prospective employers was inaugurated by the Psychological Corporation of New York City.

In a study of motormen involved in traffic accidents, Dr. O. M. Hall, of the Personnel Research Federation, found that practically half had health defects, chiefly abnormal blood pressure and hernia, and 39 per cent. had personality defects.

Recognitions and Awards

For his researches on light, particularly the discovery that monochromatic light when scattered by shining on certain transparent substances is partly changed to other colors, Sir Chandrasekhara Venkata Raman, professor of physics at the University of Calcutta, was awarded the Nobel Prize in physics.

The 1930 Nobel Prize in medicine was awarded to Dr. Karl Landsteiner of the Rockefeller Institute of Medical Research for the discovery that human blood is of four different types and that blood of one type does not always mix with blood of another type.

The Nobel Prize in chemistry was awarded to Prof. Hans Fischer of Munich for his achievement in the laboratory production of hemin, one of the components of hemoglobin, the red coloring matter of blood.

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THE WISTAR INSTITUTE OF ANATOMY AND BIOLOGY

Philadelphia, Pa., U. S. A.

BOTANY

Nature Ramblings

By FRANK THONE

Spruce and Fir

PEOPLE who complain that they "can't tell one evergreen from another" often have special difficulty distinguishing between spruces and firs. This is the more embarrassing, since the two genera are often found together on the same mountainside or in the same city park.

However, there are a number of comparison-characters that make them easy to tell apart.

In the first place, firs and spruces are alike, and are distinguished from pines and larches, by having only one needle in a given place, instead of bearing their needles in clumps. They are also alike, and set off from the pines, in having short needles. Pines have long ones.

But the needles of the spruces are stiff and sharp-pointed, so that if you grab a spruce branch you get a handful of prickles. Fir needles are soft, curved, and never have sharp points.

Again, the needles of spruces are borne up on little raised pedestals that stick out a millimeter or two on the twigs, while fir needles have their bases flush with the twig. A twig of spruce that has lost its needles is rough and prickly; a naked fir tree is smooth.

Perhaps the surest way of telling the two trees apart is to find the cones. Spruces usually have small cones (though not always), and the cones invariably hang *down*. Firs usually have large, round-ended cones, that quite as invariably stand *up*. When a spruce cone "sheds," it falls off in one piece, but when a fir cone ripens it "sheds" by letting go of its scales separately, leaving the central axis or cone-stem standing up bare and alone, like the spike on an old-fashioned candlestick.

Science News Letter, December 27, 1930

The Daniel Guggenheim gold medal for notable achievement in aeronautics was awarded to Dr. Ludwig Prandt, professor at the University of Gottingen, Germany, for "pioneer and creative work in the theory of aerodynamics."

The distinguished flying cross of the Navy was given to all members of the Alaskan Aerial Survey expedition which mapped nearly 13,000 square miles of wild country during 1926.

The Collier trophy for the outstanding contribution to aviation was given to the National Advisory Committee for Aeronautics for its cowling for radial air-cooled engines.

Dr. George H. Whipple of the University of Rochester and Dr. George R. Minot of Harvard University Medical School shared the first $10,000 Popular Science annual award given in recognition of their discovery of a successful treatment of pernicious anemia by the liver diet.

The Harmon Trophy for the outstanding achievement in aeronautics was awarded to Carl B. Eielson who piloted Sir George Hubert Wilkins across the Arctic.

The National Academy of Sciences' public welfare medal was given posthumously to Stephen T. Mather, organizer of the U. S. National Park Service.

The National Academy of Sciences' Daniel Giraud Elliot Gold Medal was awarded to Dr. Henry Fairfield Osborn of the American Museum of Natural History in recognition of his scientific monograph describing the ancient titanothere, a prehistoric creature somewhat resembling the rhinoceros.

The William H. Nichols Medal for 1930 was presented by the New York Section of the American Chemical Society to Samuel E. Sheppard of the Eastman Kodak Company for his "outstanding achievement in the chemistry of photography."

The Willard Gibbs medal was awarded to Dr. Irving Langmuir, of the General Electric Co., for "fundamental work on atomic hydrogen and on surface relations and also on electrical discharge phenomena; also for his contributions of great importance to nearly all branches of physical chemistry, including high vacuum technique, electronics, thermochemistry and catalysis, and lastly for his presentation of a theory of atomic structure."

The John Fitz Medal was awarded Rear Admiral Watson Taylor, U. S. N., retired, for his engineering achievements, the most notable of which is his utilization of the bow wave in ship propulsion.

The Franklin Medal, awarded by the Franklin Institute, was given this year to Sir William Bragg, director of the Royal Institution of Great Britain.

In recognition of his demonstration that protons act like waves, Prof. Arthur J. Dempster, of the University of Chicago, was awarded the $1,000 prize given annually by the American Association for the Advancement of Science, for an outstanding paper presented at its meeting.

The Hoover Medal was awarded for the first time, the first recipient being President Herbert Hoover.

The American Pharmaceutical Association gave its Ebert Prize for 1930 to Marvin R. Thompson of the University of Maryland for his work on the pharmacology of ergot.

Dr. R. R. Spencer of the U. S. Public Health Service was awarded the American Medical Association's gold medal for original work in preparation of a vaccine for Rocky Mountain spotted fever.

Science News Letter, December 27, 1930

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• First Glances at New Books

See also page 424

Industrial Hygiene

CARBON MONOXIDE POISONING IN INDUSTRY—May R. Mayers—*N. Y. State Department of Labor,* 243 p., (Free). The first part of this valuable monograph deals with the disease as a whole; part II takes up the industrial hazard including compensation; part III discusses the medical care of workers exposed to carbon monoxide gas. The appendix gives methods of detecting the gas in the air and blood and a discussion of gas masks and breathing apparatus. There are also several helpful tables and charts and a bibliography. The book is written in a simple, practical way and is illustrated.

Science News Letter, December 27, 1930

Zoology

AQUATIC MAMMALS — A. Brazier Howell—*Thomas,* 338 p., $5. Because of their comparative inaccessibility, aquatic mammals have yielded fewer of their life secrets to man's inquiries. Because of the enormous size of their largest representatives, the whales, relatively little work has been done on their anatomy. Yet these creatures of the sea are among the most interesting that live. Prof. Howell, who has devoted many years to their study, performs a great service to zoology, especially to anatomy, in presenting in this book an epitome of his results to date.

Science News Letter, December 27, 1930

Botany

STRASBURGER'S TEXT-BOOK OF BOTANY—*Macmillan.* 818 p., $9. This classic text, on which a whole generation of botanists whetted their teeth as students, goes through edition after edition, and although it is now surrounded by a whole forest of good general botany books it stands among them like the seed-tree of a grove among its offspring. Of the original group of writers, only Dr. George Karsten is left; the others are Dr. Hans Fitting, Dr. Hermann Sierp and Dr. Richard Harder. The translator is Dr. W. H. Lang. The present text constitutes the sixth English edition, translated from the seventeenth German edition.

Science News Letter, December 27, 1930

Health Education

HEALTH—C. E. Turner and Georgie B. Collins—*Heath,* 232 p., 80c. One of the Malden Health Series. The book is based on three years of experimental studies in the intermediate and higher grades of Malden, Mass. Taking a logical step forward from the simple health habit formation of primary days, this text gives a clear, simple reason for each habit with plenty of illustrative stories. There is a pleasing freshness and originality in the treatment which will be appreciated by the teacher, if not by the pupil.

Science News Letter, December 27, 1930

Pharmacology—Medicine

LANE LECTURES ON EXPERIMENTAL PHARMACOLOGY AND MEDICINE—Rudolf Magnus — *Stanford University* Press, 108 p., $1. Dr. Magnus' untimely death prevented his giving the Lane Medical Lectures for 1927. However, three of the five planned were written and are here published with a biographical sketch of their eminent author. A picture of Dr. Magnus and list of his works are included as Stanford University's tribute "to the memory of one of her most illustrious Lane Lecturers." The first two lectures, "The Experimental Pathology of the Lungs," and "Choline as an Intestinal Hormone" will be of interest chiefly to physicians and medical and pharmacological investigators, because of their technical nature. The third lecture, "The Physiological 'A Priori,' " has a wider appeal and is sufficiently non-technical to be read by investigators in other fields of science or even by the intelligent layman.

Science News Letter, December 27, 1930

Nature Study

TRAILSIDE CONVERSATIONS—W. H. Carr—*American Museum,* 36 p., 15c. The nature study trail, initiated some years ago by Dr. Frank Lutz, has grown up into the trailside museum in a great number of state and national parks. The booklet now in hand tells how the visitors at such little nature shrines in the Bear Mountain park near New York City seek information and how it is given to them.

Science News Letter, December 27, 1930

Physics

EVERYDAY PHYSICS—Carleton John Lynde—*Macmillan,* 577 p., $1.80. In this new high school physics text the author, who is professor of physics at Teachers College, Columbia University, emphasizes the application of physics in household and other familiar appliances.

Science News Letter, December 27, 1930

Physics

A MANUAL OF EXPERIMENTS—Robert Andrews Millikan, Henry Gordon Gale and Charles William Edwards—*Ginn,* 221 p., $1. "A First Course in Physics," by the same authors, is a high school physics text that has enjoyed a wide popularity because of the authority of their names, and the sound way in which it is written. This is a laboratory manual to accompany it, and in every way it keeps up to the high standards of the text. In each experiment several possible procedures are provided, in order to accommodate it to the various length of periods in different schools. This also enables the teachers to adapt the experiments to students of different abilities, thus keeping the entire class busy for the whole period. Simple equipment is used throughout, the authors suggesting, and quite properly, that this is often pedagogically superior to more elaborate equipment.

Science News Letter, December 27, 1930

Vital Statistics

MEDICAL BIOMETRY AND STATISTICS —Raymond Pearl—*Saunders,* 459 p., $5.50 The second revised edition has been rewritten to a considerable extent and numerous additions have been made to bring it up to date. The author states that the changes are intended to make the book better adapted to classroom teaching. The emphasis in this, as in the first edition, is on the medical rather than the mathematical view, since the book is written for students of biology and medicine. A chapter on the logistic curve is included in this edition.

Science News Letter, December 27, 1930

Chemical Engineering

TRANSACTIONS OF THE INSTITUTION OF CHEMICAL ENGINEERS—*The Institution of Chemical Engineers (London),* 218 p. This volume (No. 7) of the Transactions of this important British organization contains a record of the lectures and addresses presented during 1929. A wide variety of chemical engineering topics is covered.

Science News Letter, December 27, 1930

Aeronautics

AVIATION AND LIFE INSURANCE—Capt. Ray A. Dunn—*Daniel Guggenheim Fund*—112 p. If you fly, this pamphlet will give you some insight into the insurance protection that you can obtain.

Science News Letter, December 27, 1930

• First Glances at New Books

See also page 423

Soil Science—History

SOIL: ITS INFLUENCE ON THE HISTORY OF THE UNITED STATES—Archer Butler Hulbert—*Yale University Press,* 227 p., $2.50. Vigorously and interestingly written, approaching the subject of American history from an entirely new angle, this book will give the reader fresh insights into many corners of our national story that the conventional historical approach leaves in shadow.

Science News Letter, December 27, 1930

General Science

THE WORLD ABOUT US—Wm. Dean Pulvermacher & Charles H. Vosburgh—*Heath,* 382 p., $1.60. Here is the latest addition to the already large family of general science texts for junior high school grades. The essential parts of physics, chemistry, biology, etc., are adequately covered, and by the use of the second person throughout an attempt is made to approach closer to the student. No doubt the authors felt that the average high school student seldom, if ever, makes use of an index in a textbook, but that hardly seems sufficient excuse for omitting it entirely. The book should have one, both for the benefit it will be to the exceptional student, and to encourage the others to make use of such aids.

Science News Letter, December 27, 1930

Zoology—Classic Literature

BIRDS AND BEASTS OF THE GREEK ANTHOLOGY — Norman Douglas—*Cape and Smith,* 218 p., $3. The author has made a very happy and romantic marriage of wide erudition with a discursive and casual style. The result is a pleasant book for the general reader and a very useful book for the teacher, whether of science or literature.

Science News Letter, December 27, 1930

Physics

WORK-TEST BOOK IN PHYSICS—A. W. Hurd—*Macmillan,* 148 p., 64 c. Dr. Hurd, of the Institute of School Experimentation at Teachers' College, Columbia University, has here produced a laboratory manual in high-school physics that deserves to find extensive use. The author, with the background of years of actual teaching experience as well as research, has not attempted to cover all the ground of conventional physics, Instead he has concentrated on certain topics relating to the student's environment and of particular interest to him, such as the automobile, photography, electric lighting, refrigeration, etc. In addition to the experiments, a number of tests, as well as lists of projects, are given.

Science News Letter, December 27, 1930

Health Education

HEALTH AND HAPPINESS — Jesse Feiring Williams and Theresa Dansdill —*Sanborn,* 106 p., 64c. One of the Wholesome Living Series. An unusually attractive book for teaching health to small children. It will surely appeal to its youthful public, and is equally well adapted to reading aloud to very small tots and to study in primary grades. It has many delightful illustrations and a charming style, free from the tiresome "preaching" found in so many of these health education texts.

Science News Letter, December 27, 1930

Physiological Chemistry

THE DEVELOPMENT OF PHYSIOLOGICAL CHEMISTRY IN THE UNITED STATES — Russell H. Chittenden—*Chemical Catalogue Co.*—427 p. $6. One of the American Chemical Society monographs. The book describes briefly actual experimental accomplishments in the field in this country during the last 50 years. As a background the author describes the position of physiological chemistry and physiology in this country and abroad 50 years ago. There is no criticism of either the work or the workers mentioned in the book. The presentation is entirely expository. Institutions where the subject gained a foothold are also mentioned. Because of space limitations, some work had to be omitted but the outstanding contributions of America in this science seem all to have been included. The book will be valuable for reference as well as interesting for reading as a historical review.

Science News Letter, December 27, 1930

Botany

ELEMENTS OF PLANT SCIENCE—C. J. Chamberlain — *McGraw-Hill,* 394 p., $1.90. One of America's veteran botanists, recently retired after a lifetime of teaching, here gives other teachers the benefit of his long experience and wide knowledge. One very commendable feature about this book is that the first half of it, covering enough ground for a semester's work, is so arranged that it can be taught without microscopes.

Science News Letter, December 27, 1930

Medical Risibility

DOCTORS. AND SPECIALISTS; A MEDICAL REVUE WITH A PROLOGUE AND A GOOD MANY SCENES—Morris Fishbein—*Bobbs-Merrill,* 111 p. $1. This book is just a big laugh from start to finish, in which patients, relatives and medical men themselves will join. Unlike most humorous books, it has the virtue of ending before it stops being funny. Illustrations by Dan Layman are no small part of the fun.

Science News Letter, December 27, 1930

Botany—Horticulture

THE HOME GARDENER'S PRONOUNCING DICTIONARY—Alfred Carl Hottes —*Meredith Publ. Co.,* 88 p., 50c. How do you pronounce *Amelanchier, Fritillaria, Leucothoe?* What is a cyme, a spathe, a drupe? If you have a little garden of your own, you probably deal in all these and a lot more. And unless you are a trained botanist, you probably have a struggle with a terminology you feel you ought to know and haven't quite mastered. This little reference book has the essentials of a whole course of horticultural botany packed into its slender compass, giving common and scientific names, with pronunciations, of all the plants most used in gardens, and adding a few beautifully clear plates illustrating the commoner taxonomic terms.

Science News Letter, December 27, 1930

Chemistry

A LABORATORY WORKBOOK—William McPherson, William Edwards Henderson and George Winegar Fowler —*Ginn,* 316 p., 75c. The authors of a widely used chemistry text, "Chemistry for Today," have here produced an excellent laboratory manual to accompany it.

Science News Letter, December 27, 1930

Physics

A SURVEY OF PHYSICS FOR COLLEGE STUDENTS—Frederick A. Saunders—*Holt,* 635 p., $3.75. An excellent college physics text by the professor of physics at Harvard.

Science News Letter, December 27, 1930

Nature Study

MY ANIMAL GUESTS—Ernest Harold Baynes—*Macmillan,* 125 p., $1.75. A record of the author's friendship with a deer, with a family of skunks, with a timber wolf, fascinatingly written and beautifully illustrated.

Science News Letter, December 27, 1930